

Attitude Control Enhancement Using Distributed Wing Load Sensing for Dynamic Servoelastic Control, Phase I

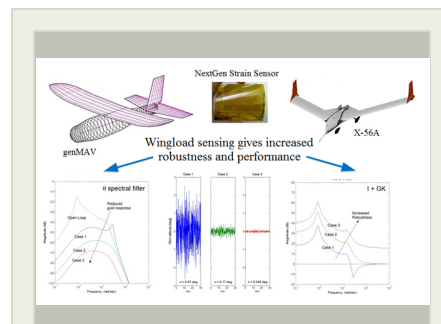
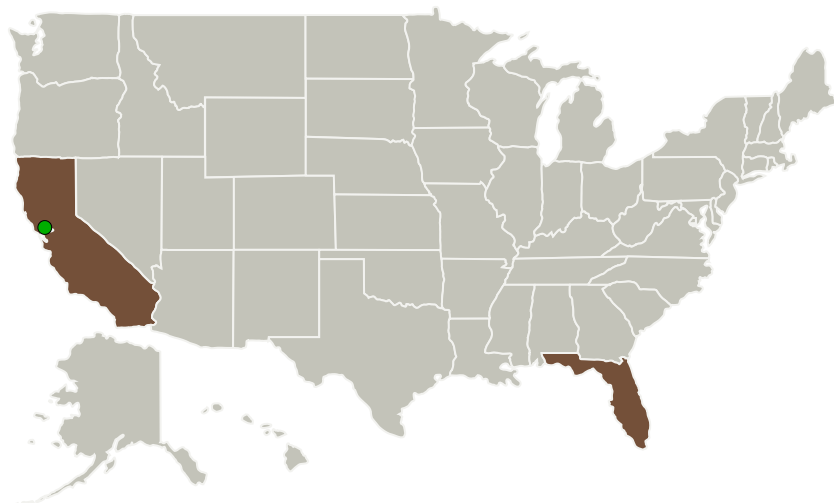
Completed Technology Project (2013 - 2014)



Project Introduction

Fly-by-feel uses distributed sensing of forces along the lifting surfaces of an aircraft. Whether such measurements are made via hot films, pressure sensors, or strain gauges, all can provide distributed force information that must be intelligently fused and utilized to achieve performance goals. Fly-by-feel will be used to achieve robust disturbance rejection, mass property augmentation, and aeroelastic tailoring. Earlier results using acceleration measurements will be duplicated and demonstrated using strain gauge measurements. Aeroelastic tailoring is a generalization of mass property augmentation whereby the modal mass and damping of selected modes will be augmented using a set of strain sensors. Technology for the design, modeling, and construction of small vehicles with flexible wings will be transferred from the university partner. Existing vehicle models will be used and updated as needed to show the feasibility of the new technology. Transition of the technology to larger vehicles will be demonstrated using models and simulation. Hardware testing using a NextGen strain sensor array will begin in Phase I and then continue in Phase II with wind tunnel and flight testing.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Systems Technology, Inc	Lead Organization	Industry	
● Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California
University of Florida	Supporting Organization	Academia	Gainesville, Florida

Primary U.S. Work Locations

California

Florida

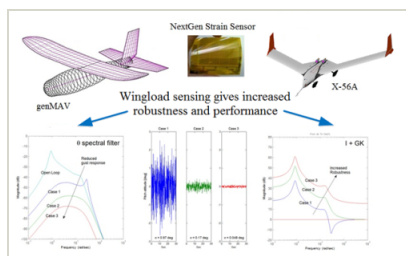
Project Transitions

**May 2013:** Project Start**May 2014:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/140483>)

Images



Project Image

Attitude Control Enhancement
Using Distributed Wing Load
Sensing for Dynamic Servoelastic
Control

(<https://techport.nasa.gov/image/135806>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission
Directorate (STMD)

Lead Organization:

Systems Technology, Inc

Responsible Program:

Small Business Innovation
Research/Small Business Tech
Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Peter M Thompson

Co-Investigator:

Peter M Thompson

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Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



Technology Areas

Primary:

- TX04 Robotic Systems
 - └ TX04.1 Sensing and Perception
 - └ TX04.1.3 Onboard Mapping and Data Analysis

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System